

NEW SPECIES OF *CALATHEA* (MARANTACEAE) FROM EASTERN BRAZIL

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ABSTRACT

*Calathea fatimae* from northern Edo. Rio de Janeiro and *C. annae* and *C. grazielae*, grown in cultivation, are described as new. All three species are in *C.* section *Breviscapus*. *Calathea fatimae* is related to *C. zebrina*; *C. annae* is most closely related to *C. louisae* and *C. albertii*; and *C. grazielae* to *C. aemula*.

KEY WORDS: *Calathea*, Marantaceae, Brazil, taxonomy, horticulture

**CALATHEA FATIMAE** H. Kenn. & Marcelo, *spec. nov.* (Figure 1). TYPE: BRAZIL. Cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Munic. Rio de Janeiro, Edo. Rio de Janeiro, Brazil, accession number MAR-101, from rhizomes collected by *Fátima Gomes de Souza* from Morro do Coco, ca. 40 km north of the city of Campos, Munic. do Campos, Edo. Rio de Janeiro, Brazil, flowered in cultivation 11 Jan. 1991, *H. Kennedy & M. de F. Gomes de Souza 4700* (HOLOTYPE: RB; Isotypes: K, Sítio RBM, UBC).

Planta 1.0-1.9 m alta. Folia basilia 1-3, caulina 0, ovata vel obovata, obtusa cum acumine, basi acuta vel obtusa, supra viridia glabra, secus costam pallide viridia, minute tomentosa, subtus purpurea, glabra; pulvinus sparse minute tomentosus ad 10 cm longus, petiolus viridis interdum rufo-tinctus, minute tomentosus 30-75 cm longus; vagina minute tomentosa, 35-65 cm longa. Spica 1, subglobosa vel ovoida ad 9.0 × 5.5 cm, pedunculo minute tomentoso 50-68 cm longo elevata; bracteae ad 40, spiraliter dispositae, coriaceae, depresso ovatae vel late ovatae, apice marcescenti, obtuso vel rotundato, virides, adpresse tomentosae, paria florum ad 10 vel ultra, prophyllum et bracteae secundariae dense minute tomentosis apicibus marcescentibus, bracteolis 2, membranaceis; ovarium album, glabrum; sepala membranacea, elliptica, rotundata, ad apicem violacea, ad 11 mm longa;

corollae et staminodia flava, tubus ad 15 mm longus, lobis ellipticis obtusis, ad 13 mm longis; staminodium exterius late ellipticum retusum, ad 12 mm longum, staminodium callosum interdum purpureo-pictum ad 13 mm longum.

Rosulate herb, 1.0-1.9 m high, bearing 1-3 basal leaves. Cataphylls initially herbaceous, rapidly dying, becoming papery, narrowly ovate, apex apiculate, initially reddish purple becoming brown, innermost cataphyll 34-62 cm long. Leaf blade firm, ovate to obovate, apex obtuse with acumen, base acute to obtuse; 50-67 × 16-29 cm. Leaf blade above dark green with velvety sheen, glabrous, midrib pale yellow to whitish green, minutely tomentose; leaf surface below purple or lightly tinged purple, glabrous except minutely tomentose at very apex, midrib deep olive-green tinged with purple apically, minutely tomentose (14× magnification) in basal 2-3 cm, glabrous apically. Pulvinus broadly elliptic in cross-section, deep olive-green, sparsely minutely tomentose to subglabrous in age on upper side, articulate with slight ridge at junction with petiole, pulvinus smaller in diameter than petiole, 6.5-10 cm long. Petiole green, occasionally tinged reddish brown, minutely appressed tomentose (14×), 30-75 cm long. Leaf sheath not auriculate, green or tinged with maroon, minutely appressed tomentose (14×), (12-)35-65 cm long.

Inflorescence terminal, 1 per shoot, borne below the leaf blades, imbricate, subglobose to ovoid, 6-9 × 4.5-5.5 cm. Peduncle with groove on one side, brownish green, minutely tomentose, 50-68 cm long. Bracts 28-40, spirally arranged, coriaceous initially, rapidly dying back at apex, broadly depressed ovate to broadly ovate in upper bracts, apex obtuse to rounded with acumen or rounded, 1.8-2.7 × 2.3-2.7 cm. Outer surface of bracts initially green, dying apically becoming brown, appressed tomentose; inner surface green, upper 1/4 sparsely tomentose, glabrous below. Bracts subtending up to 10 or more flower pairs. Flowers not shed from inflorescence, dying in place and drying black, the inflorescence thus appearing black. Bicarinate prophyll membranaceous, broadly elliptic, apex obtuse, translucent pale tan, dying apically turning black, densely minutely appressed tomentose throughout abaxially, hairs rufous, 2.2-2.6 × 2.1-2.6 cm, 1.2-1.3 cm wide, carina to carina. Secondary bract membranaceous, elliptic, apex acute, translucent pale tan, dying and turning black apically, densely minutely appressed tomentose, 2.2-2.6 × 1.2-1.3 cm; outermost ones occasionally lacking. Bracteoles 2 per flower pair, membranaceous, medial, both carinate, apex tomentose, ca. 1.8 cm long.

Sepals herbaceous to membranaceous, elliptic, apex rounded, white basally, upper 1/3-1/2 red-purple, sparsely minutely tomentose (14×), 9.5-11 × 3-4 mm. Corolla and staminodes light yellow; corolla tube slightly curved, glabrous, 13-15 mm long; corolla lobes subequal, elliptic to narrowly elliptic, apex obtuse, margins infolded appearing acute, glabrous, 11-13 × 3.5-5.0 mm. Outer staminode broadly elliptic, apex retuse, slightly reflexed downward, 11-12 × 9-10 mm. Callose staminode callose except apical 2 mm petaloid, apex obtuse, shallowly emarginate with sides reflexed, occasionally streaked with purple, 12-13 × 5-6 mm. Cucullate staminode ca. 6.5 × 5.0 mm. Stamen with lateral petaloid appendage to 1 mm wide extending to tip of anther; anther 2.5 mm long, upper 3 mm of filament free. Style and stigma pale yellow, back of style turning black after tripping. Ovary white, glabrous, 3 × 2 mm. Capsule unknown.

*Calathea fatimae* belongs to *C.* section *Breviscapus* Benth. and is most closely related to *C. zebrina* (Sims) Lindl. They share an acaulescent habit, the "velvety"

sheen of the leaves, numerous spirally arranged bracts, and the frequent retention of unpollinated flowers in the inflorescence which turn black upon drying. *Calathea fatimae* is a very striking foliage plant because of the contrast of the pale midrib region with the dark green above and the purple underleaf. It clearly has horticultural potential as a landscape plant in the wet tropics and as a house plant in the temperate region. The corolla and staminodes turn black upon drying or when preserved in 70% ETOH. This same reaction is seen in *Calathea capitata* (Ruiz & Pav.) Lindl. which likewise shows a color change in the style after tripping.

*Calathea fatimae* is named in honor of Sra. Maria de Fátima Gomes de Souza whose organization, documentation, and vouchering of the living collections, especially Marantaceae, and supervision of the herbarium for Fundação Nacional Pro-Memoria Sítio Roberto Burle Marx has been invaluable to both botanists and horticulturists. The late Roberto Burle Marx requested that this species, which she had collected, be named in her honor and also commissioned a painting of it by Mr. Mark Fothergill. The painting is at Sítio RBM.

**CALATHEA ANNAE** H. Kenn. & Marcelo, *spec. nov.* (Figure 2). TYPE. Cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Edo. Rio de Janeiro, Brazil, accession number MAR-1, from Brazil, Edo. unknown, 11 Jan. 1991, *H. Kennedy & M. de F. Gomes de Souza 4696* (HOLOTYPE: RB; Isotypes: K, RB, Sítio RBM, UBC).

Planta caulina 1.2-1.7 m alta, frequenter demum ramificans. Folia basalia 0-1, caulina 1-4(-5), herbacea, ovata, interdum elliptica, obtusa cum acumine, base rotundata vel truncata, ad 53 × 23 cm, supra nitida saturate viridia, glabra, subtus purpurea, glabra; pulvinus olivaceus vel purpureo-tinctus, minute tomentosus, ad 5.5 cm longus; petiolus atroviridis interdum rufotinctus minute tomentosus ad 48 cm longus; vagina minute tomentosa, in foliis caulinis 10-21 cm longa. Spicae 1-3, ellipsoideae vel subcylindricae 6.5-9.5 cm longae, pedunculo 4.5-15 cm longo; bracteae 10-30 spiralliter dispositae herbaceae reniformae vel transverse ellipticae apice rotundato cum acumine vel obtuso recurvato, virides 2.5-2.8 cm longae; paria florum ad 8, bracteolis 1; ovarium album glabrum; sepala anguste elliptica vel anguste obovata rotundata; corolla et staminodia cremea, tubus corollae ad 24 mm longus; lobi anguste elliptici acuti vel obtusi; staminodium exterius late ellipticum emarginatum, staminodium callosum oblongo-obovatum.

Causcenscent herb 1.2-1.7 m high. Flowering shoots bearing (0-)1-4(-5) leaves, 0-1 basal and (0-)1(-2) cauline on the main stem; axillary shoots formed in the axil of the leaf subtending the inflorescence bear 2-3 leaves and an inflorescence. Up to 3 axillary inflorescences may be produced in this manner. Cataphylls stiff, thickened basally, narrowly ovate, apex rounded, apiculate, purple, minutely tomentose (14×). Leaf blade herbaceous, ovate, occasionally elliptic, apex obtuse with acumen to acute in smaller leaves, base rounded to truncate, very shortly attenuate, (18-)28-53 × (10-)13-23 cm. Leaf blade above shiny deep green, glabrous, midrib olive-green, glabrous; lower leaf surface semi-shiny purple, glabrous, midrib olive-green basally, purple apically, sparsely minutely appressed tomentose (14× magnification). Pulvinus elliptic in cross-section deep olive-green or tinged with purple, yellow-green just at junction with petiole, minutely appressed tomentose (14×), nearly confluent

with petiole, pulvinus slightly larger in diameter, (1.4-)2.5-5.5 cm long. Petiole dark green to brownish green, minutely appressed tomentose, (1.8-)13-48 cm long. Leaf sheath not auriculate, dark green to brownish, minutely appressed tomentose, sheath of cauline, subtending leaf (4.5-)10-21 cm long; others 15-58 cm long. Stem dark green tinged purplish, minutely appressed tomentose (14 $\times$ ), felt not seen; internode between subtending leaf and next lower (second) leaf 14-71 cm, internode between second and third leaves, when present, 30-51 cm long.

Inflorescences 1-3, 1 terminal on main shoot, additional inflorescences terminating the 1-2 axillary shoots, rarely the inflorescence borne on a separate non-leafy shoot subtended by a bladeless sheath, ellipsoid to subcylindric, 6.5-9.5  $\times$  3-5 cm. Peduncle green with groove along one side, minutely appressed-tomentose at base, sparsely so above to subglabrous in apical half, 4.5-15 cm long. Bracts 10-30, spirally arranged herbaceous, lower ones reniform to transverse elliptic, apex rounded with acumen, upper bracts elliptic, apex obtuse, the apical margin recurved, 2.5-2.8  $\times$  2.7-5.2 cm; each subtending up to 8 flower pairs. Outer surface of bract shiny green, basal 1/3 minutely tomentose (14 $\times$  magnification), gradually sparser above and glabrous near apex, inner surface shiny lighter green, glabrous. Bicarinate prophyll membranous, ovate, apex rounded, translucent chartreuse green, minutely appressed tomentose on sides, center and carina glabrous, 2.4-2.7  $\times$  1.5-2.0 cm, (0.6-)0.9-1.3 cm wide, carina to carina. Secondary bract membranous, ovate, apex rounded, translucent chartreuse, minutely appressed tomentose at sides and apex, 2.0-2.5  $\times$  1.3-1.7 cm. Bracteole 1 per flower pair, medial, carinate, glabrous, 1.4-1.8 cm long.

Flowers open, shed from inflorescence if not pollinated. Sepals herbaceous centrally, margins hyaline, narrowly elliptic to narrowly obovate, apex rounded, white at base, apical 2/3 chartreuse, glabrous, 14-16  $\times$  4-5 mm. Corolla and staminodes cream-colored, glabrous; corolla 32-36 mm long, tube 22-24 mm long; corolla lobes subequal, narrowly ovate to narrowly elliptic, acute to obtuse, ca. 11-12  $\times$  4-6 mm. Outer staminode broadly elliptic, emarginate, 12-14  $\times$  9-11 mm. Callose staminode oblong-obovate, apical 3 mm petaloid, the rest callose, ca. 12  $\times$  6 mm. Cucullate staminode white at tip, ca. 6  $\times$  4 mm. Stamen with lateral petaloid appendage to 1.5 mm wide extending to basal 1/3 of anther; anther 2 mm long. Style and stigma cream-colored. Ovary smooth, white, glabrous. Capsule unknown.

*Calathea annae* also belongs to *C.* section *Breviscapus* and is most closely related to *C. louisae* Gagnep. and *C. albertii* I.W. Bailey & Raffill (syn. *C. glazioui* Petersen non Körn.). It is somewhat less closely related to *C. lietzei* E. Morren. The above species all have wider than long spirally arranged green bracts; herbaceous green sepals; cream-white corolla and staminodes with an apically petaloid callose staminode and leaves purple beneath. *Calathea annae* is distinguished from *C. louisae* and *C. albertii* by the dark green, unpatterned, leaves; the taller stature (>1 m vs. <0.9 m high); the development of axillary shoots bearing additional inflorescences in the axil of the leaf subtending the inflorescence; the deep green vs. pale green or white bracts. The development of axillary shoots (and additional inflorescences) is shared with *C. lietzei*. The unpatterned leaves and more numerous bracts (10-30 vs. 3-7) readily distinguish it from *C. lietzei*.

*Calathea annae* is named in honor of pianist Anna Candida, the musical colleague of the late Roberto Burle Marx, at his request that she be so honored. He





Fig. 1. *Calathea fatimae*. A. Habit. B. Inflorescence. C. Flower on upper leaf surface. Measurement in cm.



Fig. 2. *Calathea annae*. A. Habit. B. Inflorescence. C. Flower on upper leaf surface. Measurement in cm.



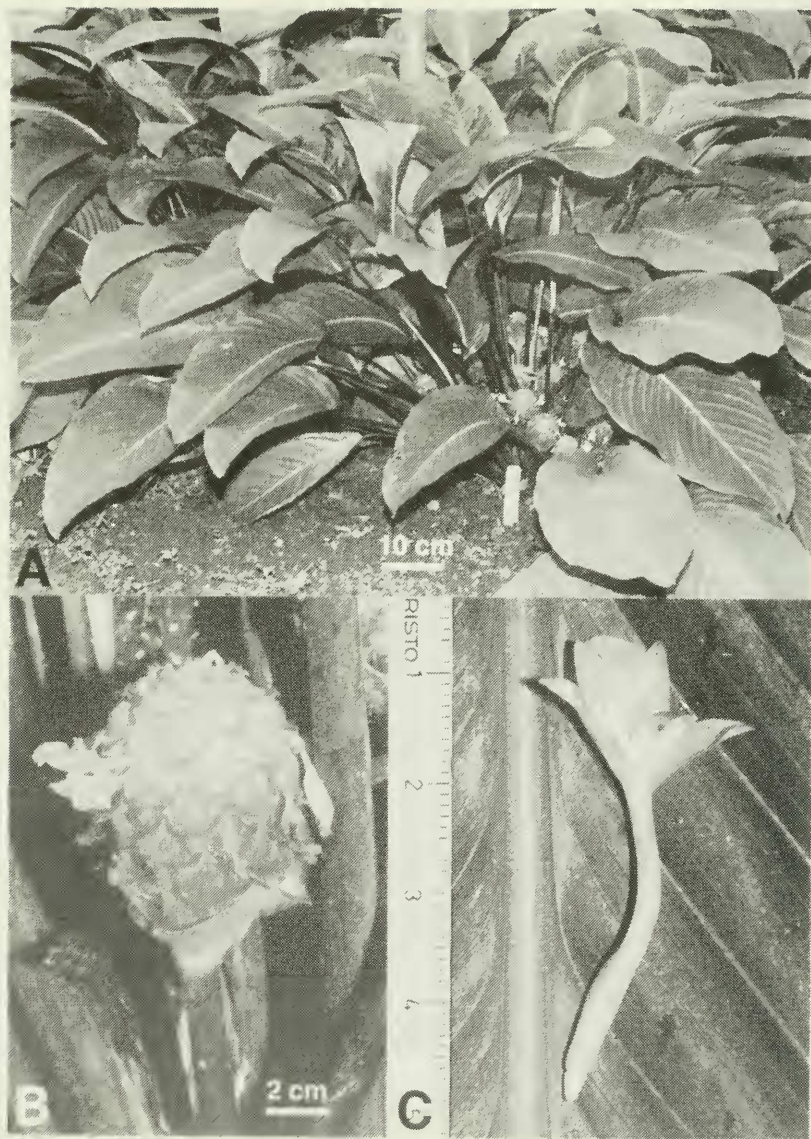


Fig. 3. *Calathea grazielae*. A. Habit. B. Inflorescence with flowers. C. Flower with mm ruler on upper leaf surface. Measurement in cm.

commissioned a watercolor painting of *C. annae* by Mr. Mark Fothergill which is at Sítio RBM.

**CALATHEA GRAZIELAE** H. Kenn. & Marcelo, *spec. nov.* (Figure 3). TYPE: BRAZIL. Cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Munic. Rio de Janeiro, Edo. Rio de Janeiro, Brazil, from rhizomes collected in Brazil, Edo. unknown, flowered in cultivation 19 Jan. 1991, *H. Kennedy & M. de F. Gomes de Souza 4699* (HOLOTYPE: RB; Isotypes: K,MO,Sítio RBM,UBC).

Planta caespitosa ad 90 cm alta. Folia basalia, 3-4 in quoque surculo principali, 2-3 in quoque surculo axillari, ovata, breviter acuminata vel obtusa cum acumine, base rotundata vel obtusa, brevissime angustata, ad  $42 \times 22$  cm, supra smaragdina splendentia glabra, subtus nitentia viridi-grisea purpureo picta vel nebulosa, glabra; pulvinus sparse minute tomentosus 2.0-3.5 cm longus; petiolus obscure brunneo-vinosus minute tomentosus ad 31 cm longus; vagina obscure brunneo-vinosus minute tomentosa. Spicae 1-3, ellipsoideae vel cylindrica  $4-11 \times 3.5-6.0$  cm, pedunculo velutino 11-18 cm longo; bracteae 50-120, spiraliter dispositae, herbaceae, depresso obovatae, obtusae cum acumine apice recurvato, virides interdum purpureo-pictae, velutinae, ad  $3.4 \times 4.0(-4.6)$  cm; sepala membranacea, obovata vel elliptica, obtusa, glabra, ad 13 mm longa; corollae aureae, glabrae, tubus 38-45 mm longus; lobis ellipticis ad 13 mm longis; staminodia aurea, staminodium exterius obovatum, emarginatum, ad  $13 \times 10$  mm, staminodium ad apicem vix petaloideum ad  $10 \times 5$  mm, ovarium glabrum.

Rosulate herb, 0.5-0.9 m high, shoots densely clustered, main shoot bearing 3-4 basal leaves with axillary shoots bearing 2-3 leaves developing in the axils of the upper 2-3 leaves. Cataphylls, narrowly ovate, apiculate, purple. Leaf blade herbaceous, ovate, apex obtuse with acumen to shortly acuminate, base obtuse to rounded, abruptly short acuminate,  $32-42 \times 13-22$  cm. Leaf blade above sparkling dark green with midrib pale to whitish green, glabrous; leaf surface below semi-shiny light grey-green, irregularly streaked and tinged with purple, glabrous, midrib tinged purple toward base, apically 3/4 yellow-green, glabrous. Pulvinus broadly elliptic in cross-section, same diameter as petiole, dark maroon, occasionally with a light green line along front, sparsely minutely appressed tomentose, more sparsely so along back, 2.0-3.5 cm long. Petiole dark purple-brown, sparsely minutely appressed tomentose (seen at  $14\times$ ), 6-31 cm long. Leaf sheath not auriculate, dark purple-brown, minutely appressed tomentose, hairs borne on a minute cushion of cells, hairs longer and more dense toward base, visible to the naked eye, 18-40 cm long

Inflorescences 1(-3) per shoot, the first one terminal on the main shoot, additional ones terminal on lateral shoots, imbricate, ellipsoid to cylindrical,  $4-7(-11) \times 3.5-6.0$  cm. Peduncle green streaked or tinged with purple apically or purple throughout, densely velvety tomentose, less densely so near base, 11-18 cm long. Bracts 50-120 (-147), spirally arranged, depressed obovate, apex obtuse with acumen, upper margin and apex recurved,  $2.3-3.4 \times 2.1-4.0(-4.6)$  cm, the first and second bracts the widest, 3.0-4.6 cm wide; each bract subtending up to 2 or more flower pairs. Outer surface of bracts light green, lowermost bracts may be tinged with purple, velvety tomentose; inner surface shiny, pale green, glabrous. Bicarinate prophyll



membranaceous, ovate to elliptic, apex rounded, occasionally retuse, translucent pale green apically, colorless below, glabrous at base, upper half sparsely pilose along sides, 2.1-2.6 × 1.4-2.1(-2.5) cm, 0.7-1.1 cm wide, carina to carina. Secondary bract membranaceous, ovate, apex rounded, pale translucent green apically, glabrous at base, upper half sparsely pilose, 2.1-2.5 × 0.8-1.4 cm. Bracteoles 1 per flower pair, medial, membranaceous, channeled, linear, transparent, glabrous, 1.1-1.5(-2.2) cm long.

Sepals membranous, obovate to elliptic, obtuse, transparent, glabrous, 11-13 × 4-5 mm. Corolla and staminodes bright golden yellow, glabrous. Corolla tube 38-45 mm long; lobes subequal, elliptic, acute to 90°, 11-13 × 4.0-6.5 mm. Outer staminode obovate, emarginate, 10-13 × 8-10 mm. Callose staminode, apex unequally 2-lobed, only the apical 1.5 mm petaloid, reflexed, 8-10 × 4-5 mm. Cucullate staminode 5-6 × 3-4 mm. Style and stigma yellow. Ovary smooth, cream-colored, glabrous, ca. 3 × 2 mm. Capsule unknown.

*Calathea grazielae* is most similar in inflorescence and floral structure to *C. aemula* Körn., sharing the spirally arranged, green, obtuse bracts with recurved apical margin; yellow corolla lobes and staminodes; and apically petaloid callose staminode. *Calathea grazielae* is readily distinguished from *C. aemula* by its plain green, unpatterned, leaves vs. patterned with a lighter yellowish 2-4 cm wide green band along the midrib; the purple tinged, glabrous vs. light green, velvety tomentose lower leaf surface and the deep purplish brown vs. green petiole and leaf sheath. The flowers in *C. grazielae* are well exerted with at least 1 cm of corolla tube evident beyond the bracts, whereas in *C. aemula* the tube is contained within the bracts. *Calathea grazielae*, like *C. fatimae*, is an attractive garden ornamental. The striking contrast of the shiny lime-green inflorescences and yellow flowers against the background of the dark maroon petioles combined with the distinctive whitish midrib of the blade above and the purple streaking and mottling below gives it great potential for horticulture.

This species is named in honor of Dra. Graziela Baroso in acknowledgment of her long devotion to the study of Brazilian plants and her numerous contributions to our knowledge of them through her teaching and numerous publications.

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